Distribution and habitat.—*Pararchaea saxicola* is known only from the Queen's Domain, Hobart, Tasmania, and was collected from under stones in May 1936.

Remarks.—I conducted field work at the Queen's Domain in January and February 2002, but found no evidence of this or any other *Pararchaea* species (despite targeted collecting). The forest was mainly dominated by *Eucalyptus* trees and extensive grassland, and signs of a recent and widespread fire were apparent.

Family Holarchaeidae Forster & Platnick

Holarchaeidae Forster & Platnick 1984: 71.

Type genus.—*Holarchaea* Forster, by original designation.

Diagnosis.—The Holarchaeidae can be distinguished from all other spider families by elongate chelicerae arising from a distinct but ventrally unsclerotized foramen, in combination with entelegyne female genitalia, an absence of peg teeth on the chelicerae and a swollen (anteriorly projecting) clypeus (see Forster & Platnick 1984). Holarchaeid spiders can also be recognized by having tarsi longer than metatarsi, widened female pedipalps distally, and spherical abdomens.

Distribution.—The Holarchaeidae are known only from Tasmania and New Zealand. Despite extensive surveying of Victorian *Nothofagus* (beech) forests (Graham Milledge, pers. comm.), holarchaeid spiders have not been found on the Australian mainland.

Remarks.—The Holarchaeidae are a morphologically and biogeographically distinct spider family, unlikely to be confused (upon close examination) with any other Araneae. New Zealand *Zearchaea* (Mecysmaucheniidae) appear superficially similar to *Holarchaea*, but with only two spinnerets, peg teeth, and a foramen completely surrounded by sclerotized cuticle, the former genus is easily distinguished.

Holarchaea Forster 1955

Holarchaea Forster 1955: 392; Forster & Platnick 1984: 76.

Type species.—*Archaea novaeseelandiae* Forster 1949, by original designation.

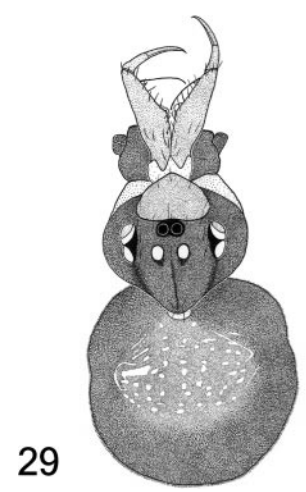
Diagnosis.—As for family.

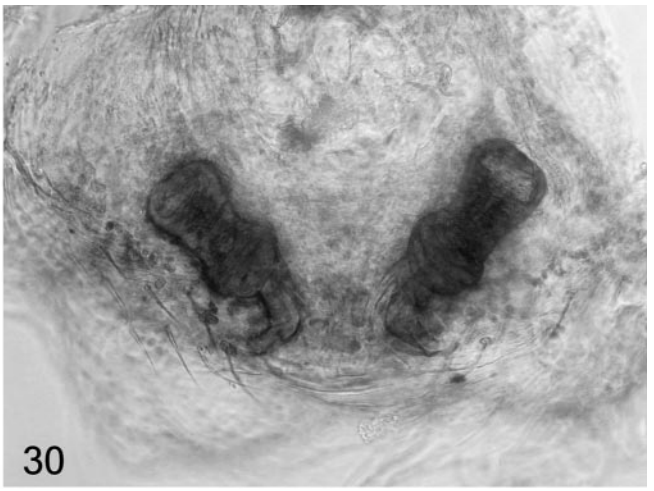
Generic description.—In part from Forster & Platnick 1984.

Cephalothorax: Carapace, when viewed laterally, anteriorly raised or triangular. Pars cephalica rising steeply from pars thoracica above level of coxa III. Lateral pars thoracica with furrow ventro-lateral to pars cephalica, dorsal pars thoracica slightly concave centrally. Viewed dorsally, carapace rounded; posterior margin of pars cephalica appearing demarcated from rest of carapace, extending to PLE. Carapace cuticle without tubercles, sometimes punctate. Eight eyes in two rows; laterals contiguous, pearly-white, widely separated from medians; AME smallest, circular, closely-spaced, dark-colored; PME oval, pearly-white, well separated. Carapace mainly devoid of hairs, except on postero-dorsal aspect of pars cephalica, clypeus and around eyes. Anterior margin of carapace encircling bases of chelicerae, with unsclerotized cuticle extending ventrally to form antero-ventrally-facing oval foramen. Clypeus large, swollen, projecting anteriorly and laterally around bases of chelicerae, connecting with sclerotized cuticle of anterior carapace ventro-laterally; longest medially (forming dorsal margin of foramen). Margin of pars thoracica smoothly curved, with separate, elongate sclerite above coxae III and IV on each side. Sternum longer than wide, posteriorly obtuse; cuticle lightly punctate. Maxillae directed across labium, not meeting in middle; serrula a single row of teeth. Labium triangular, wider than long; strongly rebordered.

Chelicerae: Paturon (Figs. 34 & 35) relatively long, elongate, constricted proximally; cuticle finely reticulated. Fang (Figs. 34–36) long, distally curved, usually hooked at tip, with raised, finely serrated prolateral edge (Fig. 36); divided at one third of length from base by transverse groove; without poison gland opening. Two or three true slender teeth on prolateral margin of paturon (Fig. 35); peg teeth absent. Pored cheliceral gland mound situated near tip of non-extended fang; retro-laterally-adjacent to proximal tooth. Hairs sparse; several filiform.

Legs and female pedipalp: Legs (longest to shortest: 1, 4, 2, 3) relatively long, slender, cuticle finely reticulated, clothed with slender smooth or weakly serrate hairs; no spines or scopulae. Single trichobothrium on metatarsi, 2 or 3 on tibiae; bothria well developed with smooth posterior hood. Tarsi longer than metatarsi, with three smooth claws; tarsi I and





Figures 29–30.—*Holarchaea globosa*: 29. Male cephalothorax and abdomen, antero-dorsal view; 30. Cleared female receptacula, dorsal view, showing bilobed morphology of each receptaculum.

II with reduced claws. Distal quarter of tarsi I and II more slender than proximal three-quarters; often with group of modified, strongly serrate hairs raised on low mounds, surrounding discoid organs of unknown function. Tarsal organ capsulate. Tibia and tarsus of female pedipalp shortened, widened, partially fused; with brush of long hairs ventrally; without claw.

Abdomen: Abdomen spherical or globose. Cuticle thin, without scutes or surface swellings; clothed with short hairs. Female epigyne a single slit-like opening, shortly anterior to epigastric furrow; lightly sclerotized, obscured by posterior of sternum in live animals and many specimens. Anterior respiratory openings lightly sclerotized. Six spinnerets; ALS largest, PMS smallest. Posterior tracheal spiracle absent. Colulus linguiform, with two posteriorly projecting hairs.

Male genitalia: Pedipalp (Figs. 31–33) with coiled embolus encircling bulb two or three times. Ventral surface of bulb relatively smooth (Fig. 32), without prominent apophyses. Cymbium spoon-shaped, with or without spine-like proximal retrolateral apophysis (Fig. 33). Patella and tibia variably-shaped, with spur-like processes distally (Fig. 33).

Female genitalia: Epigyne with single slit-like opening leading to pair of unilobed or bilobed receptacula (Fig. 30); each receptaculum with short, proximal, spur-like fertilization duct leading into bursal cavity.

Included species.—*Holarchaea globosa* (Hickman 1981), *H. novaeseelandiae* (Forster 1949).

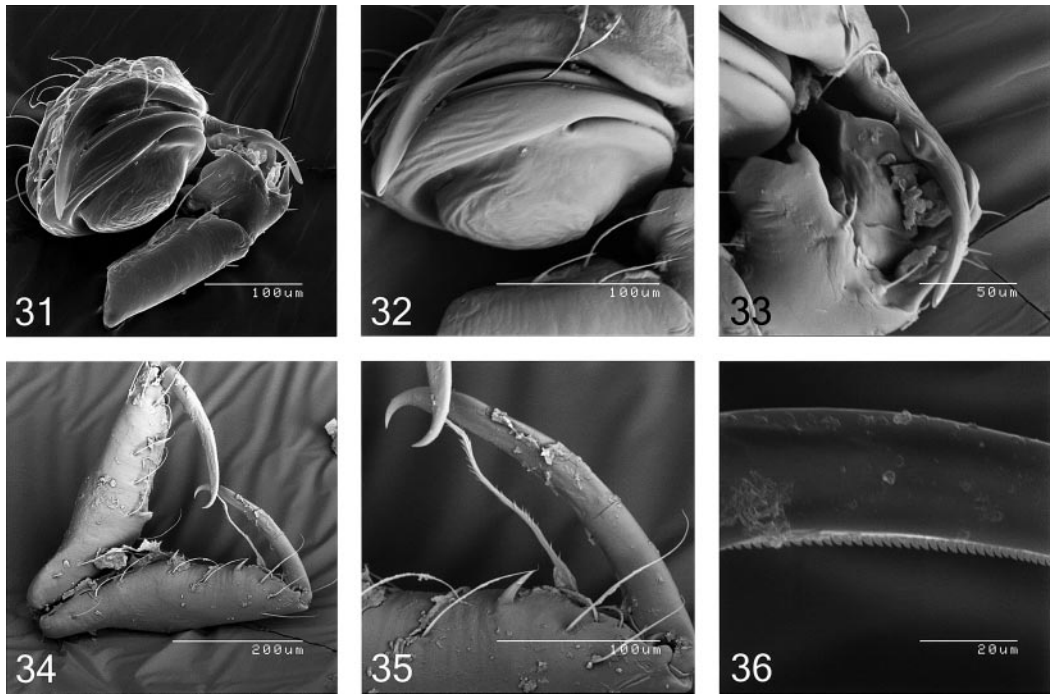
Holarchaea globosa (Hickman 1981)
(Figs. 29–36)

Zearchaea globosa Hickman 1981: 47, figs. 1–5.
Holarchaea globosa (Hickman): Forster & Platnick 1984: 76.

Type material.—Holotype female, Strathgordon, Tasmania, Australia, 42°46′S, 146°03′E, 25 April 1978, from moss, V.V. Hickman (AMS KS 6987).

Other material examined.—AUSTRALIA: *Tasmania*: 1 ♂, 1 ♀, Hogarth Falls Walk, People's Park, Strahan (QM S60756); 1 ♀, Main Cave (MU201–13v E-Tw-Tr), Montagu (QVM 13:12671); 1 ♀, same data (AMS KS 29515); 5 ♀, 2 ♂, Andrew River Caves, Western Heritage Area (AMS KS 21290); 1 ♀, Cuckoo Falls Walk, southeast of Scottsdale (QM S60755).

Diagnosis.—Male and female *H. globosa* can be distinguished from all other known congeners by the triangular shape of the carapace in lateral view (with highest point of pars cephalica separated from PME by distance greater than medial length of clypeus). Other autapomorphies include the single long, serrate, moveable hair near the base of each fang (Fig. 35), fangs with length greater than half length of paturon (Fig. 34), fangs without hooked tips (Fig. 35), a posteriorly-directed,



Figures 31–36.—*Holarchaea globosa*, pedipalp and chelicerae: 31–33, Male left pedipalp; 31. Distal segments, retrolateral view; 32. Bulb and cymbium, retro-ventral view, showing pointed distal process of cymbium; 33. Cymbium, tibia and patella, retrolateral view, showing proximal, posteriorly directed, spine-like process of cymbium and complex tibia and patella. 34–36. Female chelicerae: 34. Chelicerae, frontal view, showing relative lengths of paturon and fang; 35. Fang, distal tooth and moveable hair of right chelicera, frontal view, showing distally curved fangs and morphology of serrate moveable hair; 36. Fang, showing strongly serrated prolateral edge.

spine-like proximal apophysis on the male palpal cymbium (Fig. 33) and bilobed, distally and proximally spherical female receptacula (Fig. 30).

Without a cladistic analysis of the entire Australasian holarchaeid fauna, it is unclear whether the above autapomorphies are indicative of a highly derived species of *Holarchaea* (congeneric with the New Zealand species *H. novaeseelandiae*), or of a monotypic Australian genus, sister to the former.

Description.—*Male (QM S60756):* Carapace 0.45 long, 0.40 wide. Abdomen 0.60 long, 0.55 wide. Total length 1.05. Color: carapace dark brown. Abdomen dark brown with lighter dotted striations anteriorly and anterolaterally. Legs uniform brown. Body and legs shiny black in life. Carapace (Fig. 29): in lateral view triangular; highest point of pars cephalica separated from PME by distance greater than medial length of clypeus. Clypeus swollen; triangular in dorsal view. Chelicerae: elongate, constricted proximally, with single long, serrate, proximally-widened/flattened moveable hair projecting from near base of fang. Fang greater than half length of paturon; tip curved but not hooked; without poison gland opening. Dentition: 2 prolateral (true) teeth, widely spaced. Abdomen (Fig. 29): spherical, without surface sclerotization. Pedipalp (Figs. 31–33): patella large, wedge-shaped, with distal spurs. Tibia complex, twisted. Cymbium spoon-shaped, with prominent, posteriorly directed, spine-like apophysis proximally; retro-distally with broad, pointed apophysis. Ventral surface of bulb relatively smooth. Embolus coiled.

Female (QM S60756): Epigyne (Fig. 30): receptacula elongate, bilobed.

Distribution.—*Holarchaea globosa* specimens are known from south-west, west, north-west, south-central and north-east Tasmania.

Remarks.—Adult specimens of *Holarchaea globosa* have been collected at various

months of the year, including January, February, April, May and October.

General biology.—Very little is known about the biology of *H. globosa*. From the relatively few collection details available, it would appear that the species is restricted to wet and consistently humid habitats. Most specimens have been found on ferns or within moss and leaf litter in temperate rainforest (although several specimens have also been collected from caves: Main Cave near Montagu, Andrews River Caves and Cardia Cave near Acheron River, see Eberhard et al. 1991). Of these, the majority have not been observed alive (e.g., they were collected using tullgren extractions or pyrethrum fogging). However, I collected four *H. globosa* alive in January 2002: two from Hogarth Falls near Strahan (1 male & 1 female) and two from Cuckoo Falls near Scottsdale (1 juvenile & 1 female). All four specimens were collected from among the leaves of the 'hard water fern' (*Blechnum wattsii*, Blechnaceae), an abundant, low-growing species within many Tasmanian rainforests (Garrett 1996). The former two were found close to midnight, during persistent rain, with the male seen hanging from a single line of silk between the fern leaves. The female was swept from vegetation nearby. The Cuckoo Falls female was beaten from ferns in tall beech (*Nothofagus*) and tree fern forest during overcast and humid conditions, whilst the juvenile was collected in the same manner, close to the waterfall. Interestingly, a male and female were also collected by Lisa Boutin (QVM) at Hogarth Falls four years earlier, again during persistent rain. The diet of *H. globosa* is unknown, although of the organisms beaten from the *Blechnum* and tree ferns, oribatid mites, collembola and other spiders dominated.

Observations of live specimens.—Live *H. globosa* were maintained alive in captivity from 27 January until 11 February, 2002.

The *H. globosa* specimens I collected (see General Biology, above) were all shiny black in life (this appearance was rapidly lost after ethanol preservation), and superficially not unlike small theridiid spiders. Both sexes were agile when walking along a line of silk, but spent most of their time in captivity hanging or clinging upside-down. When lowered onto a horizontal surface the spiders would walk around until they found an object to assail, then proceed upwards to find a suitable position for resuming an upside-down pose. While walking the spiders would regularly wave their first two pairs of legs around in the air, and when at rest would occasionally do the same (with leg I). In the upside-down resting position the legs were held close against the carapace and abdomen, and the elongate chelicerae were held vertically and flat against the anterior cephalothorax and endites (at an angle to each other, to form a triangle in anterior view). While the chelicerae of many holarchaeid specimens (in ethanol) point at an angle to the cephalothorax (due to relaxation of the cheliceral muscles during preservation), those of the live spiders were not seen to extend to such a degree, and the only cheliceral movement observed was of strictly diaxial form (when the spiders 'cleaned' their legs with their mouthparts).

INTERRELATIONSHIPS OF THE AUSTRALIAN TAXA

Species-group relationships are hypothesized and outlined below for the eight described Australian pararchaeid species. Without a full revision and cladistic analysis of the family, it is unclear whether the groups as here delimited represent separate monophyletic genera, or merely clusters of similar species united by substantial homoplasy. However, multiple somatic and correlated genitalic similarities clearly exist between groups of Australian species of *Pararchaea*, and the majority of species examined by the author, including those currently undescribed from the Australian mainland, can be attributed to one of the four putatively monophyletic clades as here diagnosed.

Pararchaea saxicola species group

Diagnosis.—United by: femur of leg I with proximal retrolateral denticles; male abdomen with small to very small dorsal scute (separate or fused to anterior sclerite), not surrounding or extending posterior to level of DSP2; male pedipalp with relatively short, inwardly hooked paracymbium, and without brush of hairs in groove along retrolateral edge of cymbium.

Distribution.—Known from north-eastern Queensland, south-eastern Queensland, north-eastern New South Wales, Tasmania and south-western Western Australia.